

High Hydrogen Content Nanostructured Polymer Radiation Protection System

Completed Technology Project (2013 - 2016)



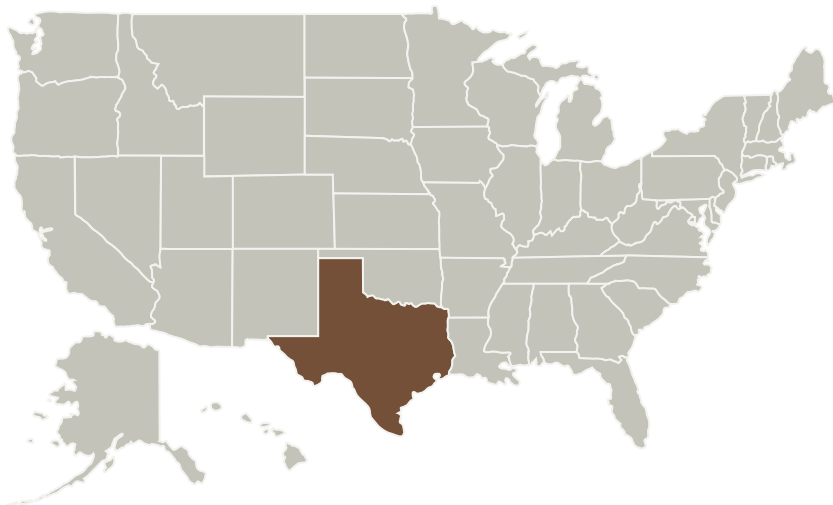
Project Introduction

The radiation hazards of space now need to be more critically mitigated as man ventures from several days/months in space to many years in space such as a trip to Mars. A new radiation protection system required for these longer manned space voyages will be developed based on the recently defined unique hydrogen uptake properties of nanostructured polymers such as polyaniline (PANI). The possibility of significantly increasing the total amount of hydrogen in PANI (and thus increasing effectiveness for radiation protection), and the polymeric nature of PANI can allow for not only realizing significant cosmic radiation protection, but also allow for good structural and form stability for shielding elements fabricated from the polymer. Further, the conductive nature of the nanostructured polymer can be additionally useful for possible electrostatic mitigation of ionic species thus allowing for active radiation protection concepts without requiring high mass number metallic components. High hydrogen content nanostructured polymers promise to meet the critical radiation protection needs of NASA and allow for man's venture into post earth orbit space.

Anticipated Benefits

High hydrogen content nanostructured polymers promise to meet the critical radiation protection needs of NASA and allow for man's venture into post earth orbit space.

Primary U.S. Work Locations and Key Partners



Project Image High Hydrogen Content Nanostructured Polymer Radiation Protection System

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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Responsible Program:

Space Technology Research Grants

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Organizations Performing Work	Role	Type	Location
University of Houston	Supporting Organization	Academia	Houston, Texas

Primary U.S. Work Locations

Texas

Images

**11959-1363022842672.jpg**

Project Image High Hydrogen
Content Nanostructured Polymer
Radiation Protection System
(<https://techport.nasa.gov/image/1687>)

Project Website:

<https://www.nasa.gov/directorates/spacetech/home/index.html>

Project Management

Program Director:

Claudia M Meyer

Program Manager:

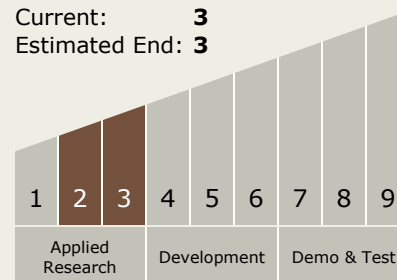
Hung D Nguyen

Principal Investigator:

Alex Ignatiev

Technology Maturity (TRL)

Start: 2
Current: 3
Estimated End: 3



Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
 - TX06.5 Radiation
 - TX06.5.3 Protection Systems